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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is arranged among the operating tables and the operators-ed who lay the operator-ed who undergoes the operation concerned in the case of an operation, and belongs to the technical field of an operator-ed incubation system which used the mat for operating tables and the mat for operating tables concerned for protecting the body of the operator-ed concerned.

[0002]

[Description of the Prior Art] Generally, in the case of operations, such as a laparotomy, in order to prevent lowering of an operator's-ed temperature, it is required to give heat to the operator-ed concerned.

[0003] On the other hand, although protecting an operator's-ed body from a decubital ulcer (the so-called bed sore) by covering with a soft mat between the operating table in which an operator-ed is laid, and the body of the operator-ed concerned is performed in the case of the above-mentioned operation. Conventionally, for incubation of the above-mentioned operator-ed, the approach of circulating the water or air heated to predetermined temperature, and the method of arranging an electric heater between an operator-ed and a mat, and heating the heater concerned were common between the body of the operator-ed concerned, and the above-mentioned mat.

[0004]

[Problem(s) to be Solved by the Invention] However, by the approach of keeping an operator-ed warm by the approach of circulating the water or air heated to the above-mentioned predetermined temperature, it was required for the bottom of an operator's-ed body to install the hose for circulating water or air etc., and since the external device for heating water or air further was also needed, there was a trouble that the equipment for incubation could not be simplified and an operator-ed could not be kept warm simple.

[0005] Furthermore, by the approach of arranging and heating a heater between an operator-ed and a mat, the heater concerned may shift during an operation, at this time, about the part shifted, heating will not be possible to an operator-ed, and there was a trouble that an operator's-ed temperature may fall.

[0006] Then, this invention was accomplished in view of each above-mentioned trouble, and the technical problem is in offering the operator-ed incubation system which used the mat for operating tables which can keep an operator's-ed body warm simple and thoroughly, and the mat for operating tables concerned.

[0007]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, invention according to claim 1 is a mat for operating tables laid on an operating table in the case of an operation, and it is equipped with heating elements, such as a heater of the temperature by which a upper limit is controlled at least, while being built in bodies of a mat, such as a software mat, and said body of a mat and raising the temperature of the body of a mat concerned.

[0008] The heating element built in in the body of a mat has a upper limit according to the operation of invention according to claim 1, controlled while raising the temperature of the body of a mat concerned, even if there is little the temperature.

[0009] Therefore, since the upper limit of the temperature is controlled at least while building in a heating element in the body of a mat, the temperature of the body of a mat can be raised with an easy configuration, and an operator's-ed body can be kept warm.

[0010] Moreover, since the body of a mat and the heating element are constituted in one, lowering of the temperature of the body of the operator-ed by a heating element shifting during an operation can be prevented. In order to solve the above-mentioned technical problem, said body of a mat and said heating element are constituted so that invention according to claim 2 may penetrate the X-rays for roentgenography in the mat for operating tables according to claim 1.

[0011] According to the operation of invention according to claim 2, since the body of a mat and a heating element penetrate the X-rays for roentgenography in addition to an operation of invention according to claim 1, roentgenography can be performed to the operator-ed concerned, with an operator-ed carried.

[0012] In order to solve the above-mentioned technical problem, it is constituted so that invention according to claim 3 may have flexibility while said heating element has the shape of a sheet which consists of conductive rubber and a carbon heater in the mat for operating tables according to claim 1 or 2.

[0013] Since it has flexibility while having the shape of a sheet which a heating element becomes from conductive rubber and a carbon heater in addition to an operation of invention according to claim 1 or 2 according to the operation of invention according to claim 3, the decubital ulcer in an operator-ed can be controlled.

[0014] In order to solve the above-mentioned technical problem, invention according to claim 4 It is an operator-ed incubation system for keeping warm the operator-ed who undergoes said operation including the mat for operating tables laid on an operating table in the case of an operation. Said mat for operating tables While having bodies of a mat, such as a software mat, and heating elements, such as a heater which it is built [heater] in said body of a mat, and raises the temperature of the body of a mat concerned, it has temperature control

means, such as a controller of the temperature of said heating element which controls a upper limit at least.

[0015] According to the operation of invention according to claim 4, the mat for operating tables contains a heating element in the body of a mat, and the heating element concerned raises the temperature of the body of a mat. At this time, a temperature control means controls a upper limit, even if there is little temperature of a heating element.

[0016] Therefore, since the upper limit of the temperature is controlled at least while building in a heating element in the body of a mat, the temperature of the body of a mat can be raised with an easy configuration, and an operator's-ed body can be kept warm.

[0017] Moreover, since the body of a mat and the heating element are constituted in one, lowering of the temperature of the body of the operator-ed by a heating element shifting during an operation can be prevented. In order to solve the above-mentioned technical problem, said body of a mat and said heating element are constituted so that invention according to claim 5 may penetrate the X-rays for roentgenography in an operator-ed incubation system according to claim 4. [0018] According to the operation of invention according to claim 5, since the body of a mat and a heating element penetrate the X-rays for roentgenography in addition to an operation of invention according to claim 4, roentgenography can be performed to the operator-ed concerned, with an operator-ed carried.

[0019] In order to solve the above-mentioned technical problem, it is constituted so that invention according to claim 6 may have flexibility while said heating element has the shape of a sheet which consists of conductive rubber and a carbon heater in an operator-ed incubation system according to claim 4 or 5.

[0020] Since it has flexibility while having the shape of a sheet which a heating element becomes from conductive rubber and a carbon heater in addition to an operation of invention according to claim 4 or 5 according to the operation of invention according to claim 6, the decubital ulcer in an operator-ed can be controlled.

[0021] In order to solve the above-mentioned technical problem, invention according to claim 7 is constituted in an operator-ed incubation system given in any 1 term of claims 4-6 so that it may consider as the predetermined temperature to which said temperature control means was beforehand set based on people's temperature in said upper limit.

[0022] Since a temperature control means considers as the predetermined temperature which was beforehand set [according to the operation of invention according to claim 7] up based on people's temperature in the upper limit of a heating element in addition to the operation of invention given in any 1 term of claims 4-6, if the predetermined temperature concerned is set as people's temperature extent, it can prevent giving heat too much to an operator-ed.

[0023] In order to solve the above-mentioned technical problem, invention according to claim 8 is constituted in an operator-ed incubation system given in any 1 term of claims 4-7 so that it may control to the predetermined temperature to which said temperature control means was beforehand set based on people's

temperature in the lower limit of the temperature of said heating element.

[0024] According to the operation of invention according to claim 8, since it controls to the predetermined temperature to which the temperature control means was beforehand set based on people's temperature in the lower limit of the temperature of a heating element in addition to the operation of invention given in any 1 term of claims 4-7, it can prevent that an operator's-ed temperature falls too much.

[0025] In order to solve the above-mentioned technical problem, invention according to claim 9 is constituted in an operator-ed incubation system given in any 1 term of claims 4-8 as said temperature control means is built in in said body of a mat.

[0026] According to the operation of invention according to claim 9, since the temperature control means is built in in the body of a mat in addition to the operation of invention given in any 1 term of claims 4-8, an operator-ed can be kept warm simpler.

[0027]

[Embodiment of the Invention] Next, the gestalt of the suitable operation for this invention is explained based on a drawing.

(I) Drawing 1 thru/or drawing 3 are used and the configuration of the mat for operating tables concerning this invention is explained at the beginning of the configuration of the mat for operating tables, and actuation.

[0028] First, the whole mat configuration for operating tables is explained using drawing 1. In addition, drawing 1 (a) is the top view of the mat for operating tables, and drawing 1 (b) is the right side view of the mat for operating tables concerned.

[0029] As shown in drawing 1, the mat 1 for operating tables concerning an operation gestalt is constituted by body of mat 1A which consists of a software mat etc., heater 2A, heater 2B, and the connecting cord 3.

[0030] In the above-mentioned configuration, body of mat 1A consists of sponge etc., and in order to protect an operator's-ed body from a decubital ulcer during an operation, it has sufficient thickness and flexibility. And sheet-like heater 2A and 2B are arranged in the field by the side of the operator-ed of the interior. As shown in drawing 1, this heater 2A and 2B are halved so that it may become symmetrical to the center line of the mat 1 for operating tables. this makes an operator's-ed the lumbar part or abdomen go up and down during an operation -- it is -- this -- corresponding -- mat 1 the very thing for operating tables -- "-- passing -- " -- a character or reverse -- "-- passing -- " -- it is for making it possible to make a character crooked.

[0031] Furthermore, the part which the part which the part which shows the actual magnitude of the mat 1 for operating tables by "A" among drawing 1 shows by "B" among about 50cm and drawing 1 shows by "C" among about 100cm and drawing 1 is about 5cm.

[0032] Next, heater 2A shown in drawing 1 and the details configuration of 2B are explained using drawing 2 and drawing 3. In addition, drawing 2 is the perspective view of heater 2A, drawing 3 (a) is the top view of the heating element in heater 2A, and drawing 3 (b) is the sectional view of heater 2A. In

addition, in the following explanation, although heater 2A is explained, it has a configuration and actuation with the same said of heater 2B.

[0033] First, if a whole heater 2A configuration is explained, it is constituted by two insulating layers 10A and 10B, heating elements 11, and connecting cords 3 as shown in drawing 2. In this configuration, insulating layers 10A and 10B are constituted by insulating materials, such as rubber sponge which consists of sheet-like polychloroprene etc., and have prevented that the current which flows a heating element 11 begins to leak in body of mat 1A. And heater 2A is constituted by pinching the sheet-like heating element 11 in the shape of sandwiches by the insulating layers 10A and 10B concerned. And by supplying an actuation current by the below-mentioned controller to this heating element, the heating element 11 concerned will generate heat and an operator's-ed body will be kept warm by warming body of mat 1A.

[0034] Next, the configuration of the heating element 11 which constitutes heater 2A is explained using drawing 3 (a). As shown in drawing 3 (a), the heating element 11 is constituted by the terminal 23 for connecting to a connecting cord 3 lead wire 21, and the electrode 20 and lead wire 21 for connecting between two electrodes 20 for passing an actuation current, and electrodes 20 to the heating element body 22 which emits heat, and the heating element body 22 concerned when an actuation current flows.

[0035] In the above-mentioned configuration, the actuation current inputted through a connecting cord 3 from the below-mentioned controller is supplied to the heating element body 22 through a terminal 23, lead wire 21, and an electrode 20. Since it is constituted by the ingredient with which the heating element body 22 mixed the inorganic substance etc. in conductive silicone rubber at the carbon fiber and metal-powder list as a carbon heater at this time, it generates heat according to the actuation current supplied from an electrode 20.

[0036] Furthermore, since it becomes deformable free while it is rich in flexibility, since the heating element body 22 concerned has the above-mentioned configuration, the heating element 11 including the above-mentioned heating element body 22 does not spoil the flexibility as the mat 1 whole for operating tables.

[0037] Furthermore, since the heating element body 22 has the above-mentioned configuration and insulating layers 10A and 10B also consist of polychloroprene etc., it has the property which penetrates the X-rays for roentgenography good as the mat 1 whole for operating tables.

[0038] Next, the sectional view is shown in drawing 3 (b) about heater 2A. As shown in drawing 3 (a) and drawing 3 (b), the electrode 20 is arranged to the ends of the heating element body 22, and has composition in which insulating layers 10A and 10B sandwich the heating element 11 whole containing the heating element body 22 and an electrode 20 concerned.

(II) The operator-ed incubation structure of a system and actuation concerning the operator-ed incubation structure of a system and actuation, next this invention containing the above-mentioned mat 1 for operating tables are explained using drawing 4.

[0039] The operator-ed incubation system S of an operation gestalt is [as

opposed to / as shown in drawing 4 (a) / heater 2A in the above-mentioned mat 1 for operating tables, and the mat 1 for operating tables concerned, and 2B] the actuation current SD. It is constituted by outputting by the controller 30 as a temperature control means to make concerned heater 2A and 2B generate heat. [0040] Moreover, the controller 30 is constituted by a power source 31, an electric power switch 41, a line indicator 42, a power supply section 32, the temperature-control section 33, the heater control section 34, a display 40, and the temperature setting-out section 43.

[0041] Moreover, each heating element 11 in above-mentioned heater 2A and 2B is equipped with a temperature sensor 35 thru/or 37. Next, actuation is explained.

[0042] In a power supply section 32, predetermined transformation etc. is given and the power-source current inputted through the electric power switch 41 and the line indicator 42 is outputted to the temperature-control section 33 and the heater control section 34. And the temperature-control section 33 transforms the power-source current concerned, and is a control signal SC to the heater control section 34. It outputs by carrying out. At this time, the temperature-control section 33 concerned is the sensor signal S1 which shows each heater 2A from each temperature sensor 35 thru/or 37, and the current temperature of 2B. Or S3 Assignment signal SI corresponding to the temperature which concerned heater 2A from the temperature setting-out section 43 and 2B should reach It compares. The assignment signal SI concerned The laying temperature and the sensor signal S1 which were set up in the temperature setting-out section 43 shown Or S3 It is a control signal SC so that the current temperature shown may become equal. It outputs. Furthermore, the temperature-control section 33 is a control signal SC so that concerned heater 2A and 2B may not generate heat across the range of the upper limit (for example, 40 degrees C) of the temperature of heater 2A set up with reference to people's temperature, and 2B, and a lower limit (for example, 30 degrees C). It outputs. Furthermore, the temperature-control section 33 is the sensor signal S1 again. Or S3 It is based and is a status signal SP. It outputs and digital display of heater 2A and the current temperature of 2B is carried out to a display 40.

[0043] In addition, detection of each heater 2A and the current temperature of 2B They are mainly temperature sensors 35 and 36 (change of the electric resistance by temperature detects current temperature, and the sensor signal S1 or S2 is outputted.) actually. It is carried out and is a sensor 37 (it is constituted by bimetal, for example, if it becomes the upper limit (for example, 40 degrees C) of the temperature of heater 2B, it is constituted so that it may stop outputting the sensor signal S3.). from -- sensor signal S3 It is referred to when failure etc. occurs in a sensor 35 or 36.

[0044] And the heater control section 34 constituted by the electromagnetic relay etc. is the control signal SC outputted as mentioned above. It is based, ON/OFF of the power-source current outputted from a power supply section 32 are controlled, and the actuation current SD for heating heater 2A and 2B is outputted to each heater 2A and 2B. It is the actuation current SD set to ON till then when heater 2A and 2B became higher than the above-mentioned laying temperature set up in the temperature setting-out section 43 by actuation of this

heater control section 34. When it is presupposed that it is off and it becomes lower than laying temperature, it is the actuation current SD. It sets to ON again and heater 2A and 2B are made to generate heat.

[0045] Next, the appearance of a controller 30 is explained using drawing 4 (b) and (c). In addition, drawing 4 (b) is the front view of a controller 30, and drawing 4 (c) is the side elevation.

[0046] In the controller 30, as shown in drawing 4 (b), the transverse plane is equipped with an electric power switch 41, a line indicator 42, the temperature setting-out section 43, and a display 40. Among these, a display 40 is the sensor signal S1 as mentioned above. Or S3 It is based and digital display of heater 2A and the current temperature of 2B is carried out. Moreover, the temperature setting-out section 43 is the above-mentioned assignment signal S1 corresponding to [consist of an one-touch switch etc., set up desired incubation temperature, and] the incubation temperature concerned. It outputs.

[0047] Furthermore, the power source 31 is arranged in the tooth back of a controller 30. Since it is controlled according to the mat 1 for operating tables of an operation gestalt, and the operator-ed incubation system S so that the temperature of the heating element 11 concerned turns into laying temperature (the above-mentioned upper limit and a lower limit are included.) while building in a heating element 11 in body of mat 1A as explained above, the temperature of body of mat 1A can be raised with an easy configuration, and an operator's-ed body can be kept warm.

[0048] Moreover, since body of mat 1A and a heating element 11 are constituted in one, lowering of the temperature of the body of the operator-ed by a heating element 11 shifting during an operation can be prevented. Furthermore, since a heating element 11 penetrates the X-rays for roentgenography, roentgenography can be performed to the operator-ed concerned, with an operator-ed carried.

[0049] Furthermore, since it has flexibility again while having the shape of a sheet which a heating element 11 becomes from silicone rubber and a carbon fiber, the decubital ulcer in an operator-ed can be controlled.

[0050] Moreover, since a controller 30 makes the upper limit of the temperature of a heating element 11 the predetermined temperature beforehand set up based on people's temperature, it can prevent giving heat too much to an operator-ed.

[0051] Furthermore, since a controller 30 controls the lower limit of the temperature of a heating element 11 to the predetermined temperature beforehand set up based on people's temperature, it can prevent that an operator's-ed temperature falls too much.

[0052] In addition, in an above-mentioned operation gestalt, although the controller 30 was made separate [the mat 1 for operating tables], it can also constitute so that the member which constitutes not only this but the controller 30 may be miniaturized and a controller 30 may be built into mat 1 the very thing for operating tables. If it does in this way, an operator-ed can be kept warm simpler.

[0053]

[Effect of the Invention] Since a upper limit is controlled according to invention according to claim 1 even if there is little temperature of the heating element concerned while building in a heating element in the body of a mat as explained

above, the temperature of the body of a mat can be raised with an easy configuration, and an operator's-ed body can be kept warm.

[0054] Therefore, an operator-ed can be kept warm with a simple configuration, without needing a complicated device. Moreover, since the body of a mat and the heating element are constituted in one, lowering of the temperature of the body of the operator-ed by a heating element shifting during an operation can be prevented.

[0055] According to invention according to claim 2, since the body of a mat and a heating element penetrate the X-rays for roentgenography in addition to an effect of the invention according to claim 1, roentgenography can be performed to the operator-ed concerned, with an operator-ed carried.

[0056] Therefore, roentgenography can be performed, without moving an operator-ed. Since it has flexibility while having the shape of a sheet which a heating element becomes from conductive rubber and a carbon heater in addition to an effect of the invention according to claim 1 or 2 according to invention according to claim 3, the decubital ulcer in an operator-ed can be controlled.

[0057] Since according to invention according to claim 4 a temperature control means controls a upper limit even if there is little temperature of the heating element concerned while building in a heating element in the body of a mat, the temperature of the body of a mat can be raised with an easy configuration, and an operator's-ed body can be kept warm.

[0058] Therefore, an operator-ed can be kept warm with a simple configuration, without needing a complicated device. Moreover, since the body of a mat and the heating element are constituted in one, lowering of the temperature of the body of the operator-ed by a heating element shifting during an operation can be prevented.

[0059] According to invention according to claim 5, since the body of a mat and a heating element penetrate the X-rays for roentgenography in addition to an effect of the invention according to claim 4, roentgenography can be performed to the operator-ed concerned, with an operator-ed carried.

[0060] Therefore, roentgenography can be performed, without moving an operator-ed. Since it has flexibility while having the shape of a sheet which a heating element becomes from conductive rubber and a carbon heater in addition to an effect of the invention according to claim 4 or 5 according to invention according to claim 6, the decubital ulcer in an operator-ed can be controlled.

[0061] Since a temperature control means considers as the predetermined temperature which was beforehand set [according to invention according to claim 7] up based on people's temperature in the upper limit of a heating element in addition to the effect of the invention given in any 1 term of claims 4-6, if the predetermined temperature concerned is set as people's temperature extent, it can prevent giving heat too much to an operator-ed.

[0062] Since it controls [according to invention according to claim 8] to the predetermined temperature to which the temperature control means was beforehand set based on people's temperature in the lower limit of the

temperature of a heating element in addition to an effect of the invention given in any 1 term of claims 4-7, it can prevent that an operator's-ed temperature falls too much.

[0063] According to invention according to claim 9, since the temperature control means is built in in the body of a mat in addition to the effect of the invention given in any 1 term of claims 4-8, an operator-ed can be kept warm simpler.

[Translation done.]